

TOBACCO 21 POLICY IMPACT ON LUNG CANCER

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Jessica Barber

University of Wisconsin- La Crosse

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Abstract

In the United States, raising the minimum age of legal tobacco sale to 21 years would reduce adolescent smoking in half within a seven-year time frame. Considering that over 90% of adult smokers report initiation of smoking before the age of 19, preventing adolescents from learning smoking behaviors before the age of 21 will deter the young adult population from becoming tobacco addicted and dying prematurely (Morain & Malek, 2017 p. 1401-1402; Ribisl & Mills, 2019, para. 13) Although, for decades, the prevalence of smoking has decreased, the decreasing rates have started slowing. Within young adult populations in particular, electronic cigarette (e-cigarette) use has up and surpassed smoking prevalence (Johnson, Mays, Hawkins, Denzel, & Tercyak, 2017, para. 2). Tobacco products include, but are not limited to cigarettes, e-cigarettes, cigars, and smokeless tobacco products that threaten the health of the population. Overall, tobacco product use is the biggest contributor to lung diseases and cancer, even though tobacco use remains the leading preventable cause of disease (Cornelius, Wang, Jamal, Loretan, & Neff, 2020, p. 1736). In the United States, cancer stands as the second leading cause of death, behind cardiovascular disease. At the top of the list, lung cancer leads as the number one cause of cancer deaths (American Cancer Society [ACS], 2020, p. 1). In order to limit the amount of lung cancer related deaths, the U.S. needs national and state level policy, along with tobacco control programs and advocacy. In December of 2019, federal legislation, signed by President Donald Trump, enacted Tobacco 21 laws that raised the legal age for buying tobacco related products to the age of 21 (Marynak et al., 2020, p. 189). For public health officials, Tobacco 21 marked a victory. However, additional efforts at the state level are needed for supporting the purpose of the Tobacco 21 federal legislation.

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Tobacco Use in Society

The main way of targeting a decrease in smoking rates is by preventing youths from learning smoking behaviors. Almost all, 95.6%, of smokers started smoking before the age of 21 years and 88% began smoking habits before the age of 18 years. The National Survey on Drug Use and Health recorded that 63.3% of youths aged 12 to 17 years, who had smoked in past months, had given money to other individuals that could buy them cigarettes (Morain & Malek, 2017, p. 1401-1402). Thus, as a way of minimizing youth participation, increasing the buying age of tobacco products to 21 years of age would limit adolescent social sources and access for obtaining tobacco related products. Adolescents that lack peers over the age of 18 have fewer opportunities for engaging in smoking activities and receiving the items from individuals old enough for purchasing the products (McKenzie & Glassman, 2019, para. 6; Morain, 2016, para. 11; Morain & Malek, 2017, p.1402). Misinformation and misperceptions keep youths from seeing the harm in using tobacco products, such as popular e-cigarettes. Over the past few years, e-cigarette use has increased with media playing a large role in the matter. Through media and social circumstances, adolescents have seen e-cigarettes as less dangerous, cleaner, healthier, safer, and easier to stop using in comparison to combustible tobacco products. Most youths do not know about nicotine and the addictive properties of e-cigarettes. With youth patients receiving majority of information from a primary care doctor, physicians must receive training and up to date information for providing reliable advice and knowledge (Johnson, Mays, Hawkins, Denzel, & Tercyak, 2017, para. 1, 21, 25). Although increasing the buying age would likely decrease adolescent access to tobacco products, additional enforcement and programming efforts need implementation, along with state participation.

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Need for Tobacco 21 Laws

While cancer stands at the second cause of death, lung cancer remains the leading cause of cancer deaths. In 2017 alone, one out of four cancer deaths were attributed to lung cancer. Jeeon et al. (2018) found, through a comparative modeling approach using simulation models, between 2015 and 2065, there will be a 79% decrease in age-adjusted lung cancer mortality. Although, the projections still show 4.4 million deaths from lung cancer while 20 million adults aged 30-84 years will continue smoking into the year 2065 (Jeeon et al., 2018, p. 687-688). By implementing Tobacco 21 legislation, public health officials hope to eliminate the behavioral adoption of smoking at youth ages into adult years. As seen in the MetroWest Adolescent Health Survey, a 49% decrease in adolescent smoking was found after the adoption of the first Tobacco 21 policy in Needham Massachusetts (Ribisl & Mills, 2019, para. 6). With such convincing evidence that Tobacco 21 laws deter youth populations from initiating smoking behaviors, each state should implement legislation for limiting premature death from tobacco addiction. Even though the federal government has signed legislation into effect, states must create their own legislation in accordance with the federal regulations.

Lung Cancer Prevalence in the U.S.

Prevalence of smoking, as of 2018, has declined by three times since 1965. In addition, in 2014, an estimation of 5,840 nonsmoking adults in the United States were diagnosed with lung cancer resulting from second hand smoking exposure, showing a decline in from 1988 by 63%. Although these numbers show great progress, individuals still die from cancers and other diseases stemming from smoking related behaviors. Of the approximate 750,000 new cancer diagnoses, 19% are caused by smoking. Men and women that smoke have a 25 times more likely

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chance of developing lung cancer. An estimation of 606,520 Americans will die of cancer in the year 2020 alone and 228,820 new cases of lung cancer will get diagnosed. With lung and bronchus leading the estimated cancer deaths in both males and females and the second leading cause of estimated new cases for both males and females, 135,720 people will die of lung cancer deaths in the U.S during the year 2020. Smoking alone causes about 30% of all cancer deaths, up to 40% for men in some southern states, while tobacco remains the leading preventable cause of death in the United States (ACS, 2020, p. 1-2, 17, 44). Although numerous public health victories have contributed to the decrease in smoking prevalence and millions of avoided premature deaths, additional efforts could further reduce the burden of tobacco on society. In order to continue the proactive fight against lung cancer, policy and programing must target the specific populations that have high smoking prevalence. Examples of potential action could include state participation in Tobacco 21 programs, control measures such as identification checks, fines and license suspension for retailers, penalties for underage use, higher taxes on tobacco, smoke free environments, coverage of tobacco treatment programs, parental involvement, adolescent education, community trainings, and marketing restriction and plain packaging (Kiernan, 2002, para. 15-17; Winickoff, 2018, para. 10). Proactive efforts such as these would prevent premature deaths, disabilities, and economic impacts.

Lung Cancer Prevalence in Wisconsin

Lung cancer prevalence varies by region based on previous smoking habits and ideals that have been seen in different states throughout previous times in history. In Wisconsin, according to the Wisconsin Department of Health Services (2019), between 2014 and 2018, e-cigarette use alone increased by 154% and one in five students were found using e-cigarettes in

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2018 (Wisconsin Department of Health Services, 2019, para. 1). Wisconsin has an average of adult smoking that almost matches the national average. With 2,600 children initiating tobacco use each year, an estimation of 106,000 children under the age of 18 will die a premature death from smoking behaviors. While \$2.66 billion gets spent on health care costs related to smoking, 14% of the Centers for Disease Control and Prevention recommended spending value gets put towards tobacco prevention efforts (Preventing Tobacco Addiction Foundation, 2020, para. 1-2). According to the American Cancer Society's Cancer Facts & Figures report (2020), in Wisconsin for the year 2020, there is an estimation of 4,290 new cases for lung cancer, second to female breast cancer. Wisconsin has an estimation of 2,690 deaths for lung cancer for the year 2020. In addition, Wisconsin has an incidence rate of 67.7 for men and 53.9 for women per 100,000 age adjusted standard population with a death rate of 48.0 for men and 34.1 for women per 100,000 age adjusted standard population for lung and bronchus cancers. Out of all cancers, lung and bronchus have the highest death rate and second highest incidence rate in Wisconsin. In comparison, Kentucky has the highest incidence rate and death rate out of all the states with an incidence rate of 111.3 for men and 77.8 for women per 100,000 age adjusted standard populations and a death rate of 80.0 for men and 50.6 for women per 100,000 age adjusted standard population (ACS, 2020, p. 5-8). Although doing well in comparison to Kentucky in regard to lung cancer death and incidence rates, Wisconsin must implement public policy and programming for helping citizens achieve healthy status and thriving lifestyles. The leading preventable cause of disease should not also be the leading cause of death by cancer.

Tobacco 21 Program and Laws

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Tobacco 21 legislation prohibits retailers from selling cigarettes, cigars, chewing tobacco, powdered tobacco, electronic cigarettes, and other tobacco products to customers younger than 21 years. Furthermore, the law outlaws anyone from selling or providing vaping paraphernalia to anyone younger than the age of 21 (Winickoff, 2018, para. 1). Although considered controversial, Tobacco 21 will provide additional opportunity for individuals to take advantage of a healthy life, especially for populations with high smoking prevalence. For years, public health officials have argued that raising the minimum age for purchasing tobacco products would benefit population health in that the prevalence of all cancers, particularly lung cancer, and smoking related disease would decrease. In promoting prevention strategies, less funding and efforts would be necessary for treatment and medical work, and less individuals will have a premature death. Initiating Tobacco 21 laws would allow for individuals to have the opportunity for thriving health that every individual deserves. Tobacco 21 legislation in the short term prevents, or at least creates obstacles for youths in accessing tobacco products. However, in the long term, preventing or stalling smoking behaviors will keep adolescents from initiating and becoming addicted to the behaviors that social and environmental circumstances influence.

Susceptible Populations

All populations would benefit, through a health perspective, as a result of Tobacco 21 legislation. However, some populations have a higher prevalence of smoking and thus, would benefit the most from policy. From Cancer Facts & Figures (2020), it has been shown that smoking prevalence has the highest rates and declines the slowest in populations of low education levels. With less educational opportunities for learning about the negative impacts of smoking and tobacco product use, individuals will have fewer reasons for not smoking or

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quitting smoking behaviors. Adolescents will have an increased chance of picking up such behaviors if their parents smoke as well. Increasing the age for purchasing tobacco products would give youths a chance to make their own health decisions at an older age rather than being influenced by environmental factors at a young age. Another population that has susceptibility of using addictive tobacco products is high school students. Throughout 2017-2018, e-cigarette use had a 14-fold increase of 78% among high school students. Overall, non-Hispanic whites participated more than Hispanics or non-Hispanic blacks for e-cigarette use (ACS, 2020, p. 45). In southern states, smoking rates soar higher than other regions of the U.S. and as a result, tobacco-related diseases have higher prevalence. Thus, southern states have a great need for Tobacco 21 coverage and programming (Ribisl & Mills, 2019, para. 11-12). Increasing the legal age for purchasing tobacco products must be accompanied by additional resources and programming. Based on this data, public health officials must work towards educating the public and find a way of targeting populations at risk for increased prevalence in tobacco use.

Effect of Lung Cancer Prevalence by Tobacco 21 Legislation

On December 20th, 2019, the United States federal government amended the Federal Food, Drug, and Cosmetic Act. The legislation, referred to as Tobacco 21, increased the age for purchasing tobacco products to 21 years of age (American Lung Association [ALA], 2020, para. 1; Maryak et al., 2020, p. 189). Before the federal government took action, 16 states had already implemented state laws that raised the legal age for buying tobacco products from 18 years to 21 years. Those states included Arkansas, California, Connecticut, Delaware, Hawaii, Illinois, Maine, Maryland, Massachusetts, New Jersey, New York, Ohio, Oregon, Texas, Vermont, and Virginia. In addition, Pennsylvania, Utah, and Washington passed laws right after the enactment

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of federal legislation (Centers for Disease Control and Prevention [CDC], 2019, para. 4). Even with the federal policy, in order for progress to occur, states must abide by the federal guidelines, implement executive state level laws, and enforce policy. Without enforcement of such laws, the given policies will not work in decreasing smoking prevalence and as a result, will not lower lung cancer prevalence. According to the Institute of Medicine report (2015), raising the legal buying age for tobacco to 21 years would decrease tobacco use by 12% by the time today's adolescents age to adult status and smoking associated deaths will decrease by 10%. With limited access of tobacco products, 15-17-year-olds will have a 25% reduction in smoking initiation and a 15% reduction in the 18-20 age category. At the national level, implementing and enforcing Tobacco 21 policy would prevent 223,000 premature deaths between the years of 2000-2019 and decrease cancer deaths by 50,000 (ALA, 2020, para. 7; CDC, 2019, para. 3). Enforcing the policy could save thousands of lives and create more opportunities for individuals to live a healthy life.

Wisconsin Adoption of Tobacco 21

After the passing of the federal legislation in December of 2019, Wisconsin state assembly passed a bill to raise the minimum age for legal sales of tobacco from age 18 to 21 on February 20th, 2020. Without the passing of state level policy, local law enforcement officers could do much for enforcing the directive given by the federal government. As stated by Dr. Carrie Chapman, member of the American Heart Association of Wisconsin Advocacy Committee, "95% of adults who smoke, start before the age of 21. The goal of Assembly Bill 422 is to prevent younger generations from developing smoking- related health issues as they get older" (Moen, 2019, para. 2-3). Wisconsin would benefit from a health stand point, through

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Tobacco 21 policy. Giving adolescents the opportunity for avoiding future health problems will decrease lung cancer prevalence in society, allow for less spending towards medical treatment, and benefit individuals in susceptible populations as they strive for reaching equitable conditions and additional opportunities within society. As of now 33 states have adopted legislation and many local municipalities, some in states without Tobacco 21 policy, have created further legislation as well (Preventing Tobacco Addiction Foundation, 2020). Wisconsin still needs work in achieving the conditions needed for decreasing smoking prevalence. This may be done through passing and enforcing Tobacco 21 policy, providing education, addiction programming, and health resources. However, passing a bill through the state assembly marks the beginning of progress.

Gaining Participation by States

In order for a decrease in lung cancer, the leading cause of cancer deaths, to occur, public health officials and policy makers must advocate for the health of populations. Not all individuals agree with the adoption of Tobacco 21 laws. In fact, some individuals view such laws as the government impeding on one's rights. Tobacco 21 does not intend to take away people's rights. However, the law does work towards preventing or deterring smoking behaviors in young adult populations. By doing so, social circumstances and uniformed decisions will no longer cause tobacco addictions that cause premature health effects, such as lung cancer, and preventable deaths in adolescent populations. For states and citizens to see the urgent need for such legislation, health officials must educate about the negative aspects of tobacco use in young adult populations (McKenzie & Glassman, 2019, para. 6; Morain, 2016, para. 11-13; Morain & Malek, 2017, p.1402). Unlike the media, that portrays tobacco use as exciting and trendy,

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primary care providers, public health specialists, health educators, and legislatures must reveal the harsh consequences associated with smoking and tobacco product use. Individuals within the young adult population, that support Tobacco 21 laws, have the strongest association with knowing about the significant dangers of tobacco products use and the use of tobacco products by a household member. In addition, the study *Attitudes Toward Tobacco 21 Among US Youth* by Dai Hongying found that middle school students support tobacco age restriction policy over high school students, females gave higher support than males, and noncurrent smokers over current tobacco users. The findings also describe that of the people who supported Tobacco 21 legislation, never smokers had a lower chance of initiating tobacco use and current tobacco users had higher intentions for quitting such behaviors (Hongying, 2017, para. 3, 21-24). Based on these results, educating individuals will increase the likelihood of support for local and state policy.

Policy and Law

With the incredible victory of the implementation of federal policy for increasing the age restriction for tobacco products, public health officials must jump at the chance for continuing the process and further efforts needed for improving lung cancer rates within the U.S. As a result, public health educators and specialists have a lot of work ahead for achieving success within this subject field. For starters, states must adopt state level policy and abide by federal policy. States with different cultures, history, and views will have conflicting opinions on Tobacco 21 legislation. Thus, the federal government must enforce policy at the state level (Ribisl & Mills, 2019, para. 11-12). Furthermore, the policy aspect must get accompanied by additional public health strategies if the goal of such policy is decreasing lung cancer prevalence in populations.

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Other areas of planning that would make accessing tobacco products difficult for adolescent populations include raising taxes on tobacco products, identification checks during purchase, increased number of nonsmoking zones, school education programs, parental resources, informative information from primary care providers, less funding for tobacco marketing, public figure publicity, and more (Kiernan, 2002, para. 15-17). Overall, a large number of efforts, such as those states above, could help target youth and susceptible populations, deterring them away from addictive smoking behaviors.

Conclusion

Smoking is a learned behavior that often times sticks when started at young ages. By preventing the sale of tobacco at early ages, more individuals will have a less likely chance of acquiring addictive smoking habits that will cause lung cancer or other smoking related diseases. Numerous studies, data, and research show the adverse, negative impacts that smoking has on one's health and wellbeing. With tobacco use being the number one preventable cause of death, and yet the number one contributor to the leading cause of cancer deaths, policy and enforcement are needed. Tobacco 21 legislation addresses and interrupts the social factors and resources that cause tobacco addiction in adolescent populations (McKenzie & Glassman, 2019, para. 8; Morain, 2016, para. 11-13; Morain & Malek, 2017, p.1402). With support from state level policy makers, the Tobacco 21 campaign could save thousands of premature deaths for young adults and create a window of opportunity for all people, including susceptible populations, to achieve a healthy lifestyle.

Tobacco control efforts that have been implemented in previous years will continue effecting lung cancer prevalence and incidence. Further efforts through prevention and cessation

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programming will need implementation for combatting the thousands of premature deaths caused by lung cancer and tobacco product use. Overall, the federal, state, and local levels of government must work together in tackling these issues. Progress has been made within this past year, but the interaction of all levels of the spectrum will allow for rapid progress in the initiatives and programs created and used for benefitting population health. In addition, at a community level, municipalities must ensure and implement educational strategies necessary for targeting the social environments of susceptible populations that impact smoking prevalence. Many efforts are needed for tackling the issues associated with smoking and tobacco use, but with all individuals working together, with policy, program, and advocacy, the leading cause of cancer deaths will no longer impact the lives those living in the U.S.

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